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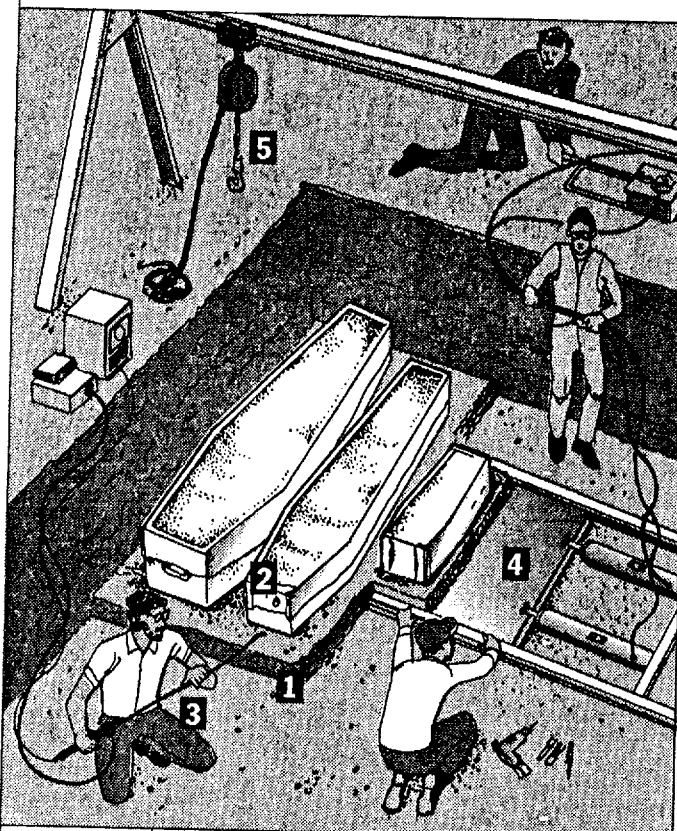
OCTOBER 27, 1992

From Md. Coffins, a Cryptic Tale

By Eugene L. Meyer
Washington Post Staff Writer

HOW TO MOVE ANCIENT LEAD COFFINS

Lead-covered wood coffins were discovered within the ruins of colonial America's first English Catholic church at St. Mary's City. Dating from the 1600s, they are believed to contain the remains of Maryland's founding family. They are not only fragile, but very heavy—the largest is estimated to weigh 1,500 to 2,000 pounds. An elaborate system has been designed to move them safely.



1 The grave is excavated, leaving a raised four-inch shelf of earth beneath each coffin. Gamma-ray technology is used to get some idea of what is inside.

2 A small hole is drilled and air samples are taken. A sophisticated system analyzes the air to see if it is pre-1850. An inert gas is then introduced to keep out oxygen that would produce decay.

3 A larger hole is drilled, and a fiber-optic scope with a flexible shaft is inserted to check for cracks and fissures. The instrument has a built-in TV camera and is similar to that used by doctors to see inside the human body.

4 In turn, a metal frame is placed next to each coffin. A metal plate is pushed under the casket by hydraulic jacks with 30 tons of pressure. Four inches of earth is kept between the casket and the heavy steel plate for safety.

5 A chain hoist lifts plate and all to a cart. Coffins then will be moved to a lab and opened, and their contents studied.

ST. MARY'S CITY, Md., Oct. 26—Such a fuss they've made over some stale air.

Whether three 17th-century lead coffins uncovered here contain pre-Industrial Revolution air has been the subject of intense speculation and media coverage encouraged by officials at this 850-acre archaeological site, Maryland's first colonial capital.

Finally today, after months of preparations and a weekend of scientific analysis of stale coffin air at NASA's Langley Research Center in Hampton, the scientists faced a roomful of reporters and cameras to announce their conclusion.

They don't know.

They may never know.

"It's extremely complex," said Wesley R. Cofer III, a NASA atmospheric scientist. Tests to determine the presence of freon, which would date the air from, say, 1940 on, were inconclusive. Other test results showing levels of carbon dioxide, methane and nitrous oxide higher than normal could be attributed to decomposition of the corpse, he said. Only time and more study may tell.

The chemical composition of old air would help provide insight on how the Earth's atmosphere has been altered since the start of the Industrial Revolution.

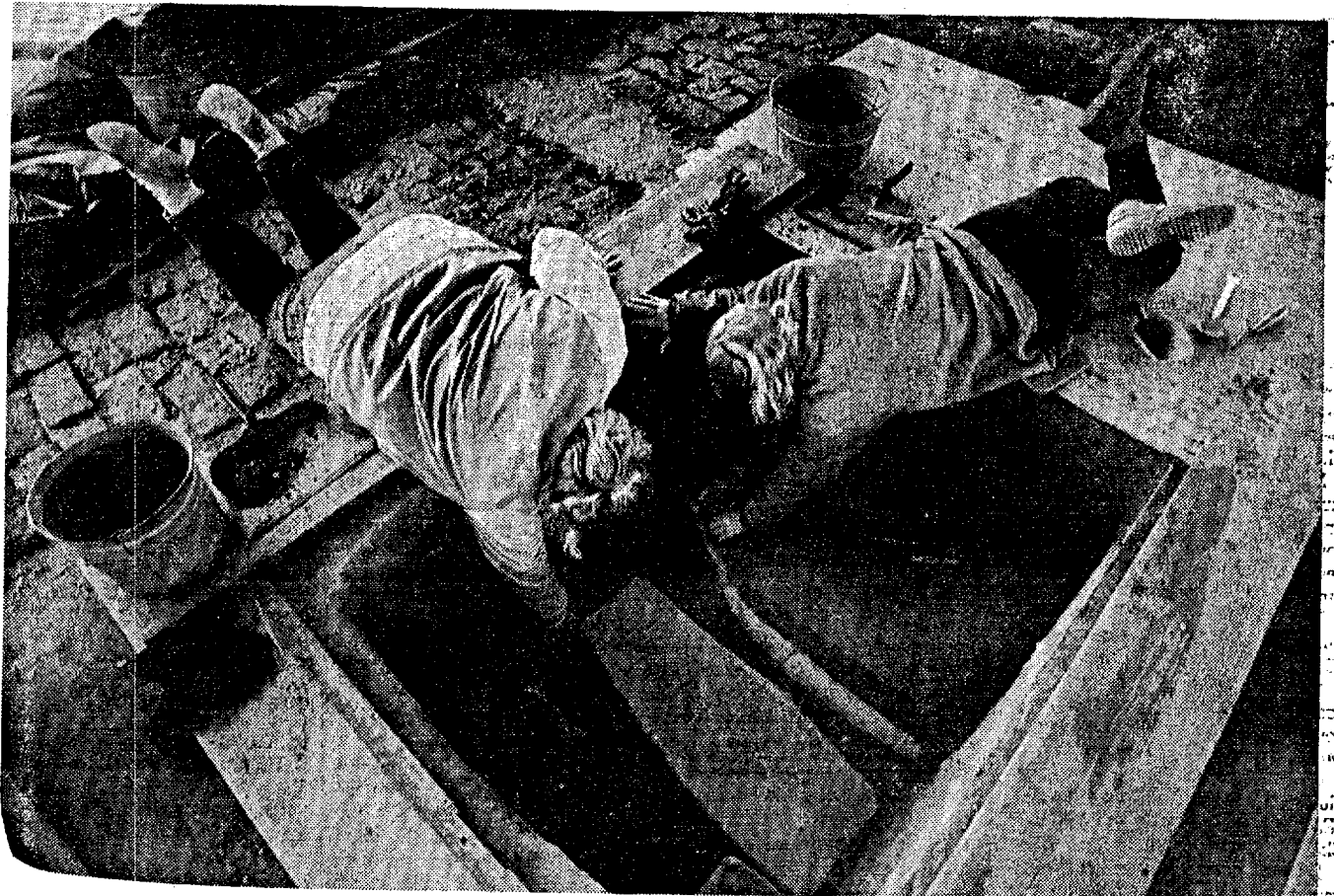
"There's no hurry," he said. "These samples sat for 300 years. They can sit another 30 days."

Said Joel Levine, his boss, "You've got to remember, less than 72 hours ago, we didn't have the air. To expect results at this point is really unrealistic. We said the chances of success were one in one million to one in one thousand."

And, said Henry Miller, director of what officials are calling "Project Lead Coffins: The Search for Maryland's Founders," there's more than hot air here. The question of who was buried in the extravagant coffins is still pending.

Official speculation about the largest coffin's inhabitant centers on Philip Calvert, half brother to Maryland's first governor and the youngest son of the first Lord Baltimore. Calvert was wealthy enough to afford a lead coffin. Miller said he is excited by the discovery of brass tacks in the largest coffin. They may be arranged in the shape of initials, he said.

The coffins were found in the foundation of the Great Brick Chapel, one of the oldest Ro-



Archaeologists uncover lead coffins in St. Mary's City, Md., in late 1990. Tests have been done to determine whether the coffins held unpolluted 17th-century air.

BY JAMES M. THRESHER—THE WASHINGTON POST

17th-Century Coffins Yield Stale Air, Little More

COFFINS, From B1

man Catholic churches in the country. But archaeologists have not found any marks that would indicate the identity of the occupants. The coffins are scheduled to be opened the second week of November.

To help identify the remains, Project Lead Coffins has enlisted Clyde Snow, a forensic anthropologist who identified the body of Nazi Joseph Mengele.

Today's non-announcement on the coffin's air quality followed days of high drama as scientists used sophisticated devices to take shadowy pictures of the coffins' insides and to extract liters of air from the largest, the only one they concluded might actually be airtight.

But today, they weren't even sure of that. Cofer said he detected in the testing results "a few ripples, one of which may be freon." If that is so, this tale from the crypt would be over.

But that was all right with Levine, NASA's chief atmospheric scientist. He said the media coverage had focused public attention on problems of global warming and the ozone layer.

The stale air caper has even inspired a "Saturday Night Live" spoof. "There's a certain

"There's no hurry. These samples sat for 300 years. They can sit another 30 days."

— Wesley R. Cofer

drama to this whole process," said Brian Myer, a producer for ABC's "Nightline," which is filming at the site. "Each day is a mystery."

To extract the air, the scientists used a device developed by Mark Moore, of the Armed Forces Radiobiology Research Institute. A custom-made hollow needle was screwed into the lead. The air was extracted and argon, an inert gas, was pumped into the coffin to preserve the remains.

The archaeological project, underway for two years now, has greatly increased attendance at the site of the colonial city, which became a ghost town after the capital was moved in 1695 to Annapolis. While no original buildings remain, Miller said, foundations, artifacts, coffins, and, just perhaps, 17th-century air were "fossilized" beneath the Southern Maryland soil.

"We shouldn't be discouraged," Levine said. "Eventually, someone will find a sample of pre-[1850] air. We have written another important chapter in that search."

The Lead Coffins

By Kenneth C. Rossignol
ST. MARYS TODAY

ST. MARYS CITY. As the assembled group of scientists and medical examiners from around the United States examined the remains of the three occupants of the now famous Lead Coffins, one member of the Historic St. Mary's City Commission staff told ST. MARYSTODAY that there were no personal belongings, no jewelry or crucifixes or other items that the pathologists use to enhance their knowledge of modern day bodies that they examine.

"Maybe people are less sure today of resurrection," said a researcher referring to modern customs of taking a little something with them into the grave. "People back then led very simple lives, they didn't have a lot and would have left their belongings behind for others".

In any event, the occupants of the first two coffins were found to have not been buried with any keepsakes. Some particles of ribbon and lace were found around the wrists of the woman and some fabric was found inside.

The one year old baby was buried with a shroud and some small brass pins had been, at the time of burial, holding the shroud in place. In the colonial days most people were buried without clothing, they took seriously the ashes to ashes proverb and were going out without the extensive clothing ensembles that are popular in today's caskets.

The expert medical examiners, who included some of the same people who work on the Armed Forces most severe and tragic aircraft crashes and took part in the Gulf War two years ago, were among those who looked the bones over for clues as to the lives the people led in the late 1600's.

The bodies would have had to have been interred in the floor of the church between 1666 and 1705--the time period which the St. Mary's Chapel was used as church before the British Crown Governor ordered it closed for worship as part of the religious persecution of Catholics in Maryland.

Paul Sledzik, a member of the Armed Services Institute of Pathology in Washington, D. C. took a break from the autopsy of the woman Wednesday evening to discuss the progress of the day.

"This is not your usual type of autopsy, but certainly a variation," he told ST. MARYS TODAY. Sledzik, dressed in the surgical cap and mask, examined his own bones after a weary day, but had lost none of the enthusiasm he had for helping to



An Army bombcart is loaded with the lead coffin containing a person that researchers had hoped would turn out to be Philip Calvert. Below, an anxious crowd of spectators and television camera operators await the hoist of the coffin. Right Paul Sledzik points to tv monitor as he discusses the autopsy of the woman in the second coffin with Joe Anderson. Below, the skull and the bones of the woman are being cleaned, and Mark Moore, below gives the final OK to bring up the last coffin.

ST. MARYS TODAY photos



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Some brain tissue may be mummified," said Sledzik.

The lead wrapping was dry-rotted and termite ridden. No other insects were present inside the coffin, no maggots were present

O! call back yesterday,

bid time return. William Shakespeare, Richard II

THIS IS WHERE IT ALL BEGAN. Long before there were Baltimore Orioles at Camden Yards or Midshipmen walking the streets of Annapolis, there was a hardscrabble village on the shores of Southern Maryland. St. Mary's City, the 17th-century colonial capital of Maryland, rose up amid strife on the site of a former Indian village. Although much of the colonial city still lies buried beneath the sod, the past is beginning to come to life.

In the fall of 1990, three lead coffins were found buried within the excavated foundation of a 17th-century brick chapel—called the Great Brick Chapel by archaeologists—the oldest Roman Catholic Church of English origin in America. Dr. Henry Miller, Director of Research at Historic St. Mary's City in St. Mary's County, recalls the day his team of archaeologists unearthed the lead coffins.

"The sky turned black, and a cold wind blew up out of nowhere," he said. "It was eerie."

The discovery was one of historical significance. Lead coffins signified wealth and social stature. Miller and fellow archaeologists Tim Riordan and Silas Hurry speculated that the unusual biers, completely encased in lead, might contain the well-preserved remains of 17th-century colonists—perhaps those of the founding Calvert family. Their excitement stemmed from an 18th-century account of two lead coffins discovered in St. Mary's City by some adventurous science students—coffins that belonged to the first royal governor of Maryland, Lionel Copley, whose remains were buried in a brick vault at Trinity Episcopal Church. In 1799, the students found the cadaver of Copley's wife to be in an exceptionally well-preserved state. The account stated that when they opened Lady Copley's coffin—some 100 years after her burial—they found that her hair, clothing and even facial features were totally preserved. Their revelation exacted a high price; within five hours of being exposed to air, she turned to dust. Now, historians and archaeologists at St. Mary's City could scarcely contain their excitement. Could there be such preservation in the coffins at Chapel Fields? And who was buried in the lead coffins?

The chapel was built in 1665 and torn down in 1704. Whoever was buried in the crypt at Chapel Fields, had to have died within that time span. Thus, the most likely candidate was Philip Calvert, a pivotal figure in Maryland's colonial history who died sometime after December 22, 1682.

Historical archaeologists at St. Mary's always knew they had one of the most pristine archaeological sites in colonial America. Jamestown, site of the 1607 colony, had long since half-eroded into the James River. Plymouth and Boston, which followed Virginia on the colonial frontier, were buried under tons of urban concrete and asphalt. St. Mary's City, however, was positioned on a high bluff overlooking a tributary of the Potomac River. In the late 1970's, land acquisition battles for the historic park were fought and, finally, over 800 acres of the townlands were procured for preservation.

Archaeological research progressed as innumerable four by four foot excavated test pits revealed where roads once led along the ancient town; where fence palings were; where structures stood; where 17th-century colonists discarded their waste. Such research gave historians much information about what early Marylanders ate, how they lived, and how the site evolved over time. As more money became available to conduct research, Chapel Fields became an archaeological summer school where St. Mary's College of Maryland students took an eight-credit summer course. Maps carefully penned under the hot summer sun provided historians with a look back into time.

The three lead coffins first appeared as a dark stained anomaly beneath the topsoil. Archaeologists could tell that the soil had been disturbed, but it wasn't until ground-penetrating radar was used during the summer of 1990 that they discovered the presence of something substantial. When the summer school was finished and archaeologists were concluding their work for the fall, they decided to determine once and for all what lay beneath the left branch of the cross.

When the lead coffins were unearthed, news media from Washington and Baltimore were

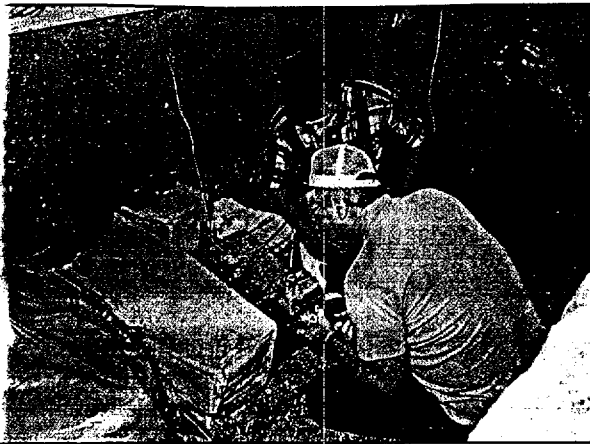
*In the aftermath
of six frenzied
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Historic St.
Mary's City,
some work has
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but for others
the work has
just begun.*

Calling Back Yesterday

COLONIAL BURIALS IN ST. MARY'S CITY

By JOSEPH NORRIS

PHOTOGRAPHS BY MARKUS WHITE U.S. NAVY PHOTO LAB



summoned to the scene. Historic St. Mary's City, which for years had struggled to gain notoriety as the site of the state's 17th-century capital, suddenly found itself thrust into the national limelight. Ted Koppel of ABC's Nightline, a St. Mary's County resident, donated \$80,000 to the project in exchange for exclusive rights to the story. St. Mary's City suddenly had something substantial to show for 25 years of laborious research.

Miller, to his credit, spent the next two years bringing together the most notable and advanced team of specialists he could find. Meanwhile, the coffins were reburied. The six-week project to unearth and open the coffins was scheduled to take place in October of 1992.

In April of 1992, Miller and Riordan examined the Copley crypt at Trinity Episcopal Church in St. Mary's City. "The Lionel Copley crypt was a very important part of the archaeology, because it helped us to think of the right questions to ask about the other three lead coffins," Silas Hurry noted later. "We knew that such coffins existed in 17th-century England, but this was a rough and ready frontier."

If the three lead coffins found at St. Mary's City had been discovered 10 years ago, much of the technology used to decipher their contents would not have been available. In the 1990's, however, historical archaeologists were able to utilize a variety of sciences to their utmost advantage. In fact, some technology was created specifically for the project. For example, Mark Moore, head of the tactical team at Historic St. Mary's City, works for the Armed Forces Radio-Biology Institute. He suggested to Miller that they use a new process called Gamma Ray Imaging to take photographs through the lead coffins to determine what was inside. Along with engineers from the Naval Warfare Center Aircraft Division and the Naval Electronics System Engineering Activity, Moore designed a device to extract air samples for NASA and

to introduce an inert gas called Argon into the coffins to help with preservation.

"This was an experiment of opportunity," NASA's Joel Levine pointed out. "Right now, one of the key questions that we're interested in is our global environment. What was the earth's atmosphere like prior to worldwide industrialization? At this point, we can only speculate because we only began making measurements of the composition and chemistry of the earth's atmosphere in 1958."

The Gamma Ray Imaging promised to yield much information. The smallest coffin appeared



to contain the reinterred remains of an adult, fueling speculation that Leonard Calvert, the first governor of Maryland, might be buried there. The middle coffin showed a skull turned to its side, but the photo taken of the largest coffin had the whole camp buzzing. To those hopeful of complete preservation, there appeared to be a human face, revealing eyes, a nose, a mouth, chin and neck. Fiberoptic cameras were inserted into the coffins and the rummaging lenses revealed incredible preservation of the wood in the largest coffin.

The first disappointment came when NASA scientists tried to analyze the roughly two liters of air they had successfully extracted from the lead coffins. Because of decomposition that had taken place inside the coffin from which the best sample was obtained, scientists thought it might be months before they could complete their analysis.

The atmosphere surrounding the actual extraction of the coffins from their resting place of 300 years was tense with excitement, but when the coffins were at last opened, there was disappointment that the preservation was not as good as had been hoped.

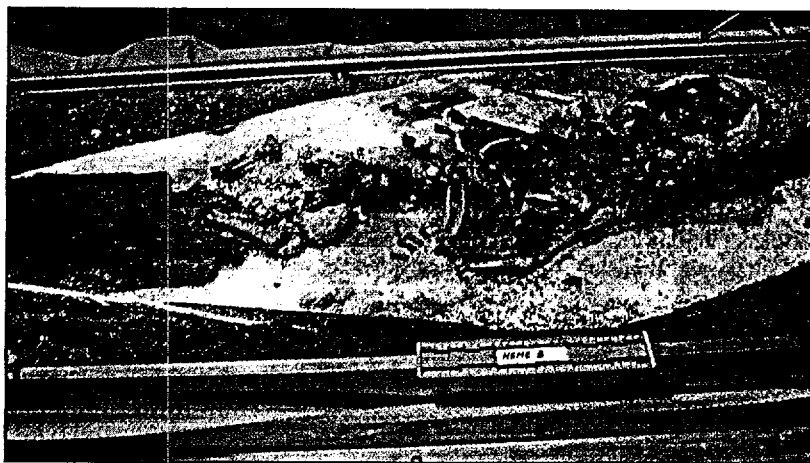
The smallest coffin was found to contain the diminutive skeleton of a six month old female child. "The child was a complete surprise," Silas Hurry commented. "In the 17th-century, it was

TOP LEFT: Mark Moore, who works for the Radiations Source Department of the Armed Forces Radio-Biology Institute, is head of the tactical team at Historic St. Mary's City. Moore helped to design a device to extract air from the coffins. Here he is preparing to introduce Argon into one of the coffins to assist in the preservation of the remains.

ABOVE: Left to right, Joe Matthews of the Patuxent River Naval Air Station, Mark Moore, and Andy Amber of the Naval Electronic Systems Engineering Activity at St. Inigoes, remove a coffin to the laboratory tent where it will be opened.

*Let's talk of graves,
of worms, and epitaphs . . .*

William Shakespeare, Richard II



Top: The remains of an infant female surprised archaeologists. In the 17th century, children under the age of six were rarely given such elaborate burial. "The fact that they interred the child in a lead-sheathed coffin," said archaeologist Silas Hurry, "speaks volumes about how important she was to somebody."

Bottom: An initial gammagraph from the largest coffin suggested the ghostly image of a human face and lead to hopeful speculation that preservation of the remains in this coffin might be complete.



extremely rare to have such effort put into a child's burial. In fact, it was not unusual to give several children the same name in the hope that one of them would live to adulthood. The fact that this child was interred in a lead-sheathed coffin says volumes about how important the child was to somebody."

The second coffin revealed the incredibly well-preserved remains of a middle-aged woman who some theorize to be the first wife of Philip Calvert, Ann Wolsey. The woman's hands, knees and feet were tied together with ribbons, apparently of silk, and a bow was still visible when the lid was lifted. The woman's hair, still intact, was brown with some gray in it.

"What is really unusual is that all over the body are sprigs of a herbaceous plant of some type which has been tentatively identified as Rosemary," Miller said. "Perhaps it was important in burial rites. There is some information that the 17th-century English associated Rosemary with remembrance."

"The woman had been in poor health for some time," he said. The femur of right leg, he explained, was broken and had been set poorly. The point of breakage had been infected and, he speculated, it might eventually have been the cause of death.

"The lower end of the femur was twisted outward, which would have caused the woman to walk with a limp," Dr. Richard Froede, Chief Medical Examiner of the Armed Forces Institute of Pathology, added. "How did it happen? It could have been a fall—a fall from a horse, for example, or a fall in the home."

Of special interest were blood clots located at the base of the woman's brain, a condition which also might have been the cause of her death. "We carefully removed the blood and, under a microscope, we could see red blood cells that were over 300 years old," Froede said. "To me, this is phenomenal."

"The blood can be rehydrated," Miller explained. "We can look at the woman's blood type and we can look at the diseases she was suffering from, since this is where the antibodies that the body produces to fight off disease reside. For example, historians have suggested that a major disease of the Chesapeake region was malaria. If this woman lived in Maryland for many years, which is likely, she would have been infected, and we will be able to look at the blood sample and identify malaria. There is a lot of information here."

The largest coffin, which had held the greatest promise for archaeologists, proved a disappointment.

"Because of the gammagrams, we had some expectation of finding good preservation," Miller said, "but what we found was a body in a very poor state of preservation. Much of the bone had been replaced by a white ash-like material that we're still trying to identify. It has completely replaced the bones and tissue of the upper body. The forensic scientists say they've never seen anything quite like it. It may be associated embalming."

"So what do we know about this individual?" he continued. "It was an adult male, approximately five foot three in height and, based upon evidence of arthritis and wear on some of the joints, probably an older gentleman. There were remnants of ribbons around the neck, at the sides and around the waist, possibly part of a garment. There is also evidence of leather. It's very unusual to find someone buried in clothing from that time period, and it is certainly unlike the burial of the woman and child who were wrapped in shrouds."

One of the clues, presently being explored by entomologists, is the absence of fly casings or larvae in the large coffin. This suggests burial in the cold time of the year—and that clue fits very nicely with speculation that the man is Philip Calvert who is known to have died in the winter months.

"There are many small clues that we're going to need to assemble and work out," Miller said.

In the aftermath of six frenzied weeks at Historic St. Mary's City, some work has been concluded, but for others the work has just begun. After being treated and stabilized, the human remains were transported to the Smithsonian. "Some samples from all of the burials were not treated so that we could have them for future chemical tests," Hurry explained. "We must be extremely careful not to lose information." Historians and preservationists are recording information about the construction of the wood and lead portions of the coffins; tree-ring dating specialists are studying the wood itself. The Armed Forces Institute of Pathology is going to do DNA analysis on the physical remains, and if they

The project has drawn attention to the fact that Historic St. Mary's City is a spectacular archaeological site.

can extract DNA from the child, they may be able to look at genetic relationships between the child and two adults. Additionally, the ramifications of Project Lead Coffins for forensic science are wide-ranging.

Mark Moore was not disappointed. "Those coffins could not have been treated better if they were made out of crystal," he said. "We wanted to give the forensic scientists the best chance to find and assemble information, and I am pleased with the results."

And what has Project Lead Coffins done for Historic St. Mary's City? The fallout is already evident. Tourism to the site in 1992 was up substantially.

"The project has drawn attention to the fact that this is a spectacular archaeological site," Miller said. "The lead coffins are only one of the rich historical resources still to be discovered here. St. Mary's City is a unique and irreplaceable part of our history."

Silas Hurry was emphatic in his agreement. "The origins of Maryland are buried here at St. Mary's City but only by careful historical and archaeological research are we going to be able to bring this history to life. We want to commemorate and tell that story."

"The 17th century was, in many ways, an alien time," he continued, "but the 17th century set many things in motion—helping to create an American personality and way of life that is really different from that of the English or any other European group."

"It's been very exciting," Miller said finally, "and very draining. The people who volunteered their time, resources and energy have been remarkable. From the project's inception we have tried to make sure that everything was done in a proper and respectful manner. It will be fitting to be able to remark these graves and to say who these individuals are." ❖

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